


been obvious to incorporate such a beveled edge reduction with the disclosure of Schulz-Harder in order to enable rigid support for the circuit board portion prior to singulation. This rejection is respectfully traversed.

The invention overcomes a very specific problem of ceramic/metal substrates produced by a heat process, namely the DCB process or active soldering. Due to the high temperatures involved in the processes, and the fact that the thermal expansion co-efficient of ceramic and metal are very different, cooling on the substrate from the temperatures to room temperature causes internal stresses in the ceramic layer. These internal stresses cause uncontrolled breaks in the ceramic layer when the board is broken into smaller individual substrates. Uncontrolled breaks can be avoided by edge reduction of the break line and providing a distance of the substrate areas from one another along the predetermined break line.

Von Vajna uses plastic material for the printed circuit board not subjected to high temperature processes. Von Vajna discloses a circuit board panel 100 divided into individual circuit boards 103 and salvage 101. The two portions are separated by score lines 105 and routed areas 109. The score lines serve as predetermined break lines. There is no disclosure of a beveled area adjacent a predetermined break line as the beveled area is the predetermined break line. One of ordinary skill in the art would substitute a predetermined break line for the beveled score lines 105, but there is no disclosure or suggestion of using a predetermined break line in conjunction with a beveled score line.

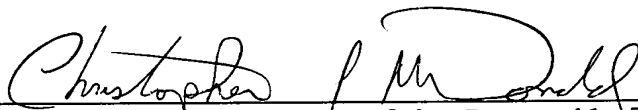
Claim 53 has been amended to specify that the edges of the metal surfaces of neighboring substrates are spaced, not only a distance from one another, but also a distance from the predetermined break line. New claim 54 includes all limitations of amended 53 and further recites that the edge reduction is formed by depressions, holes, grooves or by steps. These recited structures would not serve to form a break line as the beveled edges of Von Vajna. Therefore, it would not be obvious to use such structures in place of a beveled edge.



There is no teaching in the prior art of using a edge reduction in addition to a predetermined break line. Von Vajna shows a beveled edge that is a predetermined break line. The claims are allowable over the prior art and favorable action is eagerly and earnestly solicited. If any issues remain and the Examiner believes a telephone conversation would resolve such issues, the Examiner is urged to contact the undersigned attorney.

If any fees are due and owing, the Commissioner is authorized to charge Deposit Account 08-2455.

Respectfully submitted,

by   
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